

**REMARKS**

This Amendment is being filed in response to an Office Action dated May 16, 2003. For the following reasons this application should be allowed and the case passed to issue.

No new matter is raised by this amendment. Support for the amendment to claim 10 is found in Fig. 1 and the accompanying portions of the specification, which clearly teaches the wire 20 extending along the outer periphery of the first semiconductor chip between the first 18 and second 16Y' pads. Fig. 1 and accompanying portions of the specification (page 9, lines 14-16) support new claim 13. New claim 14 is supported by Fig. 1 and accompanying portions of the specification (page 9, line 23 to page 10, line 2). Support for new claims 15 and 16 is found in Fig. 1 and accompanying portions of the specification (page 11, lines 14-19) that clearly discloses a plurality of pads adjacent the outer periphery of first and second semiconductor chips. New claims 17 and 18 are supported by Fig. 3 and accompanying portions of the specification (page 13, line 18 to page 14, line 14). Figs. 1, 6, and 7, and accompanying portions of the specification (page 17, line 25 to page 18, line 11) support new claims 19-21.

Claims 7-10 and 13-21 are pending in this application. Claims 1-6, 11, and 12 have been cancelled. Claims 7-9 are withdrawn. Claim 10 is rejected. Claims 13-21 are newly added.

***Information Disclosure Statement***

Applicants have not received an initialed copy of the Information Disclosure Statement (IDS) form 1449 filed September 5, 2000, indicating consideration of the cited reference. Applicants respectfully request the Examiner include an initialed copy of the

IDS filed September 5, 2000, with the next Official Action. For the Examiner's convenience, a copy of the IDS, cited reference, and the filing postcard are attached to this response.

***Claim Rejection Under 35 U.S.C. § 103***

Claim 10 is rejected under 35 USC § 103(a) as being unpatentable over alleged admitted prior art (APA) in view of Wark et al. (U.S. Patent No. 5,847,445) and Fukui et al. (U.S. Patent No. 6,100,594).

This rejection is traversed, and reconsideration and withdrawal respectfully requested. The following is a comparison between the instant invention as claimed, and the cited prior art.

Claim 10 requires a first semiconductor chip positioned on the circuit board and a second semiconductor chip is positioned on the first semiconductor chip. The circuit board has a first pad, a second pad spaced away from the first pad in a direction along the outer periphery of the semiconductor chip, and a wire connecting between the first pad and the second pad on a surface of the circuit board supporting the first semiconductor chip. The wire extends along the outer periphery of the first semiconductor chip between the first and second pads. The wire is printed on the circuit board together with the first pad and the second pad. The second semiconductor chip has a third pad positioned adjacent to the second pad but away from the first pad on the circuit board. The second pad on the circuit board and the third pad on the second semiconductor chip are electrically connected through a bonding wire so that the third pad on the second semiconductor chip is electrically connected with the first pad on the circuit board through the wire, the second pad on the circuit board, and the wire on the circuit board.

The Examiner asserts that the APA discloses a semiconductor device including a circuit board 102, semiconductor chips 110, 112, connection pads 104-1, 104-2, etc., spaced away from each other, and bonding wires 116. The Examiner acknowledges that the APA fails to specify the second pad spaced away from the first pad in a direction along the outer periphery of the chip and a wire being printed on the board, the wire connecting the first and second pad. The Examiner asserts that Wark teaches a printed circuit board (PCB) having conductive traces/strips 64 (FIG. 5) patterned and extended in lengthwise or widthwise direction along an outer periphery of the chip such that bonding site on the PCB can be located at any point spaced away/extended in a lengthwise or widthwise direction along the outer periphery of the chip. Fukui is relied on for forming a wiring portion/trace pattern on a circuit board/substrate using a metal deposition and photolithography/printing process. The Examiner concludes that it would have been obvious to incorporate a circuit board having first and second pads such that the second pad is spaced away from the first pad in a direction along the outer periphery of the chip and a wire printed on the board connecting the first and second pads so that the bonding wire length and wire bonding defects can be reduced and the electrical connection towards the outer periphery can be accomplished by the APA.

The APA, Wark, and Fukui, whether taken alone, or in combination, fail to suggest the claimed semiconductor device. None of the references suggests the circuit board with a first pad and a second pad spaced away from the first pad in a direction along an outer periphery of the first semiconductor chip, and a wire connecting between the first pad and the second pad, and the wire extending along the outer periphery of the first semiconductor chip between the first and second pads, as required by claim 10. Wark teaches a plurality

of conductive strips 64 **extending away from an outer periphery** of die 50. Wark does not disclose a first pad and a second pad spaced away from the first pad in a direction along an outer periphery of the first semiconductor chip, and a wire extending along the outer periphery of the first semiconductor chip between the first and second pads, as required by claim 10. Fukui in FIG. 7(a) teaches two pads spaced away from each other and connected by a wire in a **direction extending away from** the outer peripheral edge of the semiconductor chip, not along the outer periphery of the chip, as required by claim 10.

The combination of the cited references also fails to suggest the claimed device with a third pad on the second semiconductor chip positioned adjacent to the second pad but away from the first pad on the circuit board, and the second pad on the circuit board and third pad on the second semiconductor chip electrically connected through a bonding wire, so that the third pad is electrically connected to the first pad, as required by claim 10.

The Examiner asserts that the conductive strips of Wark extend along an outer periphery of the chip such that a bonding site/first pad on the PCB can be located at any point spaced-away/extended from the second bonding pad site/pad in a lengthwise or widthwise direction along outer periphery of the chip. However, the Examiner has not pointed out, nor is it seen, where Wark discloses both the first and second bonding pads on the conductive strips 64.

Typically, when a semiconductor device has a first chip provided on a circuit board and a second chip provided on the first chip, the connecting line between the top smaller chip and the base circuit board tend to extend obliquely, which may cause unwanted crossing and extension of the bonding wires. However, the claimed arrangement of the pads on the circuit board solves such problems.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge readily available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). There is no suggestion in the cited references to form a first pad and a second pad spaced away from the first pad in a direction along an outer periphery of a first semiconductor chip on a circuit board, and to form a wire connecting the first pad and the second pad on the circuit board, the wire extending along the outer periphery of the first semiconductor chip between the first and second pads, as required by claim 10.

The requisite motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. § 103 is not an abstract concept, but must stem from the applied prior art as a whole and realistically impel one having ordinary skill in the art to modify a specific reference in a specific manner to arrive at a specifically claimed invention. *In re Deuel*, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995); *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989). Accordingly, the Examiner is charged with the initial burden of identifying a source in the applied prior art for the requisite realistic motivation. *Smiths Industries Medical System v. Vital Signs, Inc.*, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999); *In re Mayne*, 104 F.3d 1339, 41 USPQ2d 1449 (Fed. Cir. 1997). There is no motivation in the cited references to a form a first pad and a second pad spaced away from the first pad in a direction along an outer periphery of first

semiconductor chip on a circuit board and connected by a wire, the wire extending along the outer periphery of the first semiconductor chip between the first and second pads.

The only teaching of the claimed semiconductor device is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicants' disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The Examiner's conclusion of obviousness is not supported by any factual evidence. The Examiner's retrospective assessment of the claimed invention and use of unsupported conclusory statements are not legally sufficient to generate a case of *prima facie* obviousness. The motivation for modifying the prior art must come from the prior art and must be based on facts.

The dependent claims further distinguish the claimed invention. For example, claim 13 requires that the semiconductor device is mounted on a mother board. Claim 14 requires a fourth pad on the circuit board positioned adjacent the outer periphery of the first semiconductor chip. A fifth pad on the first semiconductor chip is required by claim 15. Claim 16 further requires a sixth pad on the second semiconductor chip positioned adjacent the outer periphery of the second semiconductor chip. The cited prior art does not suggest the claimed semiconductor device with these additional limitations.

New independent claim 17 requires two pads on the circuit board spaced away from each other along an outer periphery of the first semiconductor chip and two pads on the first semiconductor chip spaced away from each other along an outer periphery of the second semiconductor chip. New independent claim 19 requires two pads on the circuit

board spaced away from each other along an outer periphery of the first semiconductor chip. The cited prior art does not suggest these claimed semiconductor devices.

In light of the amendments and remarks above, this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY



Bernard P. Codd

Registration No. 46,429

600 13<sup>th</sup> Street, N.W.  
Washington, DC 20005-3096  
(202) 756-8000 BPC:BPC  
Facsimile: (202) 756-8087  
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